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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/774,577 | 02/01/2001 | Akira Oosawa | Q61225 | 5559 |

7590 11/28/2006

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| EXAMINER |
|---|
| AZARIAN, SEYED H |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2624 | |

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/774,577 | OOSAWA, AKIRA | |
| | Examiner | Art Unit | |
| | Seyed Azarian | 2624 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 2,3,5-7,9-11,13-15,17-19,21-23,25-31,33,34,36-38,40-42,44-46,48-50,52-54,56-62 and 65-75.

Continuation of Disposition of Claims: Claims rejected are 2,3,5-7,9-11,13-15,17-19,21-23,25-31,33,34,36-38,40-42,44-46,48-50,52-54,56-62 and 65-75.

**Continued Examination Under 37 CFR 1.114**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 8/10/2006 has been entered.

## Claim Rejections - 35 USC § 103

2. Following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2, 3, 5-7, 9-11, 13-15, 17-19, 21-23, 25-31, 33-34, 36-38, 40-42, 44-46, 48-50, 52-54, 56-62 and 65-75, are rejected under 35 U.S.C. 103(a) as being anticipated over Kano et al (U.S. patent 5,359,513) in view of Hiyama et al (U.S. patent 5,379,757).

Regarding claim 70, Kano discloses an inter-image operation method comprising the steps of, carrying out an inter-image operation between two or more sets of base image data each representing a distinct base image of an identical object to obtain processed image data therefrom, (column 2, lines 29-49, providing changes between a pair of temporally sequential medical images and detecting abnormal regions where the two images are matched with each

other, also Fig. 11A, column 12, lines 44-67, as shown digital image input device supplies the same digitized image to each of image memories 110 and 120, each of these memories has a first output has a first output which is received by ROI image memory and shift–map generator, local matching is performed (processed image data));

recording history data on past inter-image operations (column 14, lines 40-46, "**locations (angles) of the detected possible interval changes**" (history data) can be indicated using notations such as arrows superimposed (recorded) "**on**" the subtraction image (processed image) or the **original image** (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data), also Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors);

storing the two or more sets of base image data and attaching the history data to the stored two or more sets of base image data (column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction, also column 5, lines 34-47 refer to determine and calculation of shift mapping, furthermore, column 14, lines 17-46, the subtraction images can be viewed by the radiologist as a final data output, which **displayed** along with the

original images for comparison purposes of the original images with subtraction images can be **displayed** either as softcopy such as video displays or as hardcopy, to detect or identify interval changes, which can thus provide information to radiologists).

However Kano clearly discloses that notations **(history data)** can be superimposed (**recorded**) on the subtraction image and base images, but applicant's remarks that (history date on past inter-image), is not limited to file names and location, also **(patient identification)**, which is not recited in body of claim 70. For this feature, examiner is using this reference, supplied with this action, Hiyama (U.S. Patent Number 5,379,757) in the same field of medical imaging discloses (column 68, lines 64-68, through column 69, lines 1-5, from the data input part 839 **patient data such as name, date of birth, image record (history data)** are superimposed (**recorded**) on the RGB signals (inter-image)). Furthermore, Hiyama states (column 75, lines 64-68, through column 76, lines 1-7 that user inputs from the data input part 839 (history data) an inter-image reference recording order (past inter-image) and a control signal is transmitted to the respective memories). It would have been obvious to one skilled in the art at the time the invention was made to modify Kano that teaches superimposing information on an image with the teachings of Hiyama the superimposed notations would include patient history data such as patient's name, dates of images, identification numbers, angles of images and name of imaged portion on a base image, inter-image, or any image such as an x-ray, that could be stored in memory which can easily be implemented in digitized medical images.

Regarding claim 2, Kano discloses an inter-image operation method according to claim 70, wherein the history data on the past inter-image operation are attached to the processed image (Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is

performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors).

Regarding claim 3, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations are attached to the processed image data obtained through the inter-image operation (column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction).

Regarding claim 5, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations include information identifying the base images each represented by one of said two or more sets of the base image data used for calculating the processed image data (column 5, lines 1-22, to obtain improved image registration between the two images).

Regarding claim 9, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations include such data indicating whether or not the processed image data on a certain processed image have already been obtained (column 5, lines 24-33, matching between each corresponding pair of ROIs and comparing the result and column 8, lines 59-66, best match location are selected to perform a fine –search for local matching in the second step for accuracy).

Regarding claim 13, Kano discloses an inter-image operation method according to Claim 9, wherein the history data on the past inter-image operations include information on recording sites of the processed image data obtained in the past, and wherein a desired set of the processed image data stored at the recording site thereof is fetched and outputted instead of conducting the inter-image operation to recalculate the desired set of the processed image data, if it was found by referring to the history data that the desired set of processed image data had already been obtained (column 12, lines 44-68, clearly discloses the digital image input device supplies the same digitized image to each of the image memories 110, 120 (which referred as **past image**). Each of these memories has a first output, which is received, by RIO location. Image memory 120 has a second output, which is received by subtraction calculator 210. Local **matching is performed in calculator** 150, which output the **result** to generator 160 and calculation to memory 170, where the **result stored** in memory 190. A curve-fitting calculator 180 receives the output of memory 170 and performs the curve fitting function described above.

The result of this process is stored in memory and **subsequently displayed** to an output display device **for viewing by the radiologist**. It is obvious that processed image that is stored in the memory must be **retrieved (fetched)** in order to be view by the radiologist. Thus Kano does teach the claim limitation as recited in claim 13.

Regarding claim 25, Kano discloses an inter-image operation method according to claims 70, wherein the inter-image operation includes a subtraction operation on a pixel-by-pixel basis between said two or more sets of the base image data (Fig. 1, steps 10 and 20. Digital images 1

and 2 are obtained at different points in time, and column 12, lines 29-43, subtraction image can be created by subtracting the pixel values).

Regarding claim 26, Kano discloses an inter-image operation method according to claims 70, wherein each of said two or more sets of the base image data is a set of data representing an original image (Fig. 14A-14D, column 13, lines 48-55, using two temporally sequential original images).

Regarding claim 28, Kano discloses an inter-image operation method according to claims 70, wherein the base images each represented by one of said two or more sets of the base image data are taken at different points in time (column 15, lines 64-68, determining differences between first and second images during time interval).

Regarding claim 30, Kano discloses an inter-image operation method according to claims 70, wherein each of said two or more sets of the base image data represents a radiation image for medical use (Fig. 14A, column 4, lines 25-26, shows a radiographic image of a patient's chest X-ray (refer to radiation image)).

Regarding claim 68, Kano discloses the apparatus of claim 67, wherein the inter-image operation means searches the database by the header information to determine whether the inter-image operation has been carried out (column 5, lines 60 through column 6, line 12).

Regarding claim 71, Kano discloses an inter-image operation method comprising the steps of: carrying out an inter-image operation between two or more sets of base image data each representing a distinct base image of an identical object to obtain processed image data therefrom (see claim 70, also, column 2, lines 29-49, providing changes between a pair of temporally sequential medical images and detecting abnormal regions where the two images are matched

with each other, also Fig. 11A, column 12, lines 44-67, as shown digital image input device supplies the same digitized image to each of image memories 110 and 120, each of these memories has a first output has a first output which is received by ROI image memory and shift–map generator, local matching is performed (processed image data));

and recording history data on past inter-image operations (column 14, lines 40-46, "locations (angles) of the detected possible interval changes" (history data) can be indicated using notations such as arrows superimposed (recorded) "on" the subtraction image (processed image) or the original image (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data);

wherein the two or more sets of base image data each represent a distinct base image of a patient and wherein the history data comprises one or more of a name of the patient; dates on which the two or more sets of base image data were obtained, an identification number or name of an imaged portion of the patient (see claim 70 also Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors and column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction, also column 5, lines 34-47 refer to determine and

calculation of shift mapping, furthermore, column 14, lines 17-46, the subtraction images can be viewed by the radiologist as a final data output, which displayed along with the original images for comparison purposes of the original images with subtraction images can be displayed either as softcopy such as video displays or as hardcopy, to detect or identify interval changes, which can thus provide information to radiologists);

and an angle of the imaging of the patient (column 14, lines 40-46, "**locations (angles) of the detected possible interval changes**" (history data) can be indicated using notations such as arrows superimposed (recorded) "**on**" the subtraction image (processed image) or the **original image** (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data), also column 15, lines 18-35).

Regarding claims 6, 10, 14, 18, 22, 33, 37, 41, 45, 49 and 53, it recites similar limitation as claim 2 is similarly analyzed.

Regarding claims 7, 11, 15, 19, 23, 34, 38, 42, 46, 50 and 54, it recites similar limitation as claim 3 is similarly analyzed.

Regarding claims 65 and 67, it recites similar limitation as claim 4 is similarly analyzed.

Regarding claims 17, 40 and 48, it recites similar limitation as claim 9 is similarly analyzed.

Regarding claims 21, 44 and 52, it recites similar limitation as claim 13 is similarly analyzed.

Regarding claims 27, 29 and 31 it recites similar limitation as claims 25, 26, 28 and 30 and are similarly analyzed.

Regarding claims 66, 69 and 72-75 it recites similar limitation as claim 70-71 are similarly analyzed.

Regarding claim 36, it recites similar limitation as claim 5 is similarly analyzed.

Regarding claim 56, it recites similar limitation as claim 25 is similarly analyzed.

Regarding claim 57, it recites similar limitation as claim 26 is similarly analyzed.

Regarding claim 58, it recites similar limitation as claims 25 and 26 are similarly analyzed.

Regarding claim 59, it recites similar limitation as claim 28 is similarly analyzed.

Regarding claim 60, it recites similar limitation as claims 25 and 28 are similarly analyzed.

Regarding claim 61, it recites similar limitation as claim 30 is similarly analyzed.

Regarding claim 62, it recites similar limitation as claims 25 and 30 are similarly analyzed.

*Other prior art cited*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent (5,882,330) to Lemelson is cited for drugs and method for treating diseases.

U.S. patent (5,151,795) to Adachi is cited for method for compressing and extending image signals.

U.S. patent (4,558,462) to Horiba et al is cited for apparatus for correcting image distortions automatically by inter-image processing.

U.S. patent (6,424,996) to Killcommons et al is cited for medical network system and method for transfer of information.

## *Contact Information*

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.
Status information about the PAIR system, see http:// pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Seyed Azarian*
*Patent Examiner*
*Group Art Unit 2624*
November 26, 2006

Seyed azarian